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ANALYSIS OF SELECTED BLOOD PARAMETERS IN FOALS IN THE PERIOD FROM BIRTH TILL ABLACTATING

Abstract. *Properly selected hematological research allows for the effective assessment of the state of the homeostasis as well as picturing the potential disorders of the patient's (or herd's) state. However, for such a change to occur, it is necessary to refer the achieved results to the especially formulated referential norms not only for the species but also the age and breed or the particular usability. The aim of the research was gaining proper reference values of the hematologic system in foals of pure Arab blood as well as in Polish cold-blooded breed, in the life period from birth to ablactating. The morphological examination was performed ex tempore with the help of the automatic haematological analyzer MS9 (Melet Schloesing – France). The achieved results show that the majority of hematological indicators of the red blood cell systems of hot-blooded foals, especially in the first 2-3 months of their life, are statistically slightly higher, and what is more, the dynamics of their changes usually appears earlier and more frequently, reaches a higher intensity, and exemplifies a closer mutual correlation than in the cold-blooded foals. Furthermore there exists a substantial difference in the average values of the researched markers as well as their spreading in time of the foal's development between the group of the hot-blooded and the cold-blooded horses.*

Key words: *foals, hot-blooded, cold-blooded, red blood cell indicators, withdrawal period*

Entrance. The tradition of Arab horse breeding in Poland as well as the constantly growing interest in the cold-blooded breeds results in the need for finding optimal preventive and diagnostic methods, helpful in the monitoring of health, especially that of foals, with the use of contemporary methods of instrumental diagnostics, taking into account the developmental changes with regard to hematological and biochemical indicators in the foals of Arab and cold-blooded horses. This contemporary control focuses on the proper implementation of the "foal health protection program," therefore the choice and performance of particular lab analyses, which constitute measurable indicators of the so-called "state of health profile." Properly selected hematological and biochemical research allows for the effective assessment of the state of the organism's homeostasis as well as picturing the potential disorders of the patient's (or herd's) state and even accurate following of the course of particular changes or portraying the activity of the chosen organs. However, for such a change to occur, it is necessary to refer the achieved results to the especially formulated referential norms not only for the species but also the age and breed or the particular usability.

Material and methods. Therefore, the major aim of the research was the achievement of the "personal" referential values for given hematological and biochemical indicators in the foals of pure blood Arabs as well as the foals of the cold-blooded breeds, in the time from birth till withdrawal. With the use of the automatic hematological analyzer MS9 - Melet Schloesing - France, RBC, Hb, HCT, MCV, MCH, MCHC, RDW, PDW, and WBC have been marked, while in the so-called extended morphological research - the proportionally microscopic pattern of white blood cells, monocytes, thrombocytes. With the use of dry analyzer VETTEST 8008 by IDEXX Laboratories, Inc. marks have been made in the serum of the total protein content, albumin, globulin, glucose, total bilirubin, creatine, lipase activity, creatine kinase, asparaginian aminotransferase (AST), alkaline phosphatase (ALKP) and the magnesium and calcium content. Among other aims, making the interpretation of the observed tendencies and changes easier, were: the dynamic analyses of the changes appearing with the fowls' growth and the comparative analysis of the particular parameters in the racial approach. During the seven consecutive researches performed with one month breaks 336 samples have been extracted from 48 pure blood Arab foals and 119 samples from 17 cold-blooded foals, and 11.125 various markers have been made, the results of which were subjected to an appropriate statistical analysis with the use of the computer program Statistica 6.0.

Results. The aforementioned analysis shows that the greatest changes in the values of the researched parameters were observed in the first month of the foal's life, which leads to believing that it is the critical period from the point of view of the clinical analysis. Furthermore, it was proven that there exists a substantial difference in the average values of the researched markers as well as their spreading in time of the foal's development between the group of the hot-blooded and the cold-blooded horses. In the case of the biochemical research the difference regards 40-50% of results, and in case of the hematological research - more than 60%. The majority of the hematological markers of the red blood cells system of the hot-blooded foals, especially in the first 2-3 months of their life, are characterized statistically by the slightly higher values and the dynamic of their changes usually appears earlier and more often, achieves a greater intensity and shows a tighter mutual correlation than in the cold-blooded foals. In the sphere of the hematological markers of the white blood cells system there appeared quite rarely statistically important differences between the groups as well as mutual (between the factors) correlative connections, or trends comparable for both groups. The research between the groups shows that in the hot-blooded foals the dynamics of the growing number of changes in the particular markers of protein transformation reaches a higher intensity and indicates a close positive correlation and in the case of albumin as well as the a/g index visibly higher values. ALB is characterized by the constant growth in both of the researched groups, with the synthesis taking place faster and more effectively in the hot-blooded than in the cold-blooded horses. The important growth in globulin takes place only after the 6th month in both of the researched groups, which is in all probability connected with the development of the characteristic immunity.

The decrease in the level of urea starts in the first month and lasts till the fifth month, achieving the lowest values in the fifth month in both of the researched groups. In the hot-blooded foals both markers of the mineral transformation behave

differently in comparison to the cold-blooded ones and show higher calcium content in consecutive extractions. In this group the dynamics of the growing value changes of the Ca content reach a greater intensity, however, in the group of the cold-blooded foals they show a closer mutual positive correlation with the Mg content. The AST activity proved in the research to have the highest growth in the first month in the hot-blooded foals and in the second month in the cold-blooded foals, and the increasing tendency until the end of the research in the hot-blooded, and until the fifth months in the cold-blooded. The Bil content manifested the greatest, statistically unimportant decrease in the first month until the half of the birth value in the cold-blooded and more than half in the hot-blooded foals. The Crea content presented a slow constant increase from the second month of life after the fall in the first month in both of the researched groups.

The LIP activity is characterized by the statistically small importance of differences between the groups observed throughout the whole period of the experiment. The dynamic, statistically important increase in the activity in the period between birth until the first month of life appears in both of the researched groups, after which the activity remains on the constant level, in the group of the cold-blooded foals on a higher than in the hot-blooded. In case of the hot-blooded foals the increase in the CK activity until the fourth month remained stable, then suddenly this activity grew in the second month in a statistically important manner, reaching the maximum value in the fourth month, after which the decrease in activity began. In case of the cold-blooded foals the average CK activity after birth was slightly higher than in case of the hot-blooded ones, suddenly significantly fell in the second month of life, and then exemplified a constant increasing tendency until the fifth month, decreasing in the sixth. The ALKP activity in the consecutive months of the hot-blooded and cold-blooded foals was greatest just after birth.

The important decreases in the ALKP activity were noted until the sixth month of life, and the greatest fall appeared in both of the groups in the first month.

Discussion. The detailed proportional analysis of the spreading of the achieved results confirms the small accuracy of the norms included in the particular analyzers, because almost 1/3 of the results (around 33%) places either above (almost 20%) or below (almost 13%) their borders. What is more, the aforementioned borders are inaccurately scaled for the majority of markers, because they are either too narrow or too broad. The results achieved in personal research as well as the data from the works cited confirm the need for using, both in the contemporary diagnostics as well as horse therapy, horses from extremely specialized inter-species norms, taking into consideration the age, the usability type and even the manner of use.

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